

## NET AREAS OF STRUCTURAL ANGLES—I

Sum of Length of Legs	Thickness	Weight	Area	Area after Deducting for			
				One $\frac{5}{8}$ Rivet	$\frac{3}{4}$ Rivets	$\frac{7}{8}$ Rivets	
4"	$\frac{3}{16}$	2.5	0.72	0.58	—	—	—
	$\frac{1}{4}$	3.2	0.94	0.75	—	—	—
	$\frac{5}{16}$	4.0	1.15	0.92	—	—	—
	$\frac{3}{8}$	4.7	1.36	1.08	—	—	—
	$\frac{7}{16}$	5.3	1.56	1.23	—	—	—
$4\frac{1}{2}$ "	$\frac{3}{16}$	2.8	0.81	0.67	0.65	—	—
	$\frac{1}{4}$	3.7	1.06	0.87	0.84	0.62	0.56
	$\frac{5}{16}$	4.5	1.31	1.08	1.04	0.77	0.69
	$\frac{3}{8}$	5.3	1.55	1.27	1.22	0.89	0.79
	$\frac{7}{16}$	6.1	1.78	1.45	1.40	1.02	0.90
5"	$\frac{1}{2}$	6.8	2.00	1.62	1.56	1.12	1.00
	$\frac{3}{16}$	3.1	0.90	0.76	0.74	—	—
	$\frac{1}{4}$	4.1	1.19	1.00	0.97	0.75	0.69
	$\frac{5}{16}$	5.0	1.47	1.24	1.20	0.93	0.85
	$\frac{3}{8}$	5.9	1.73	1.45	1.40	1.07	0.97
$5\frac{1}{2}$ "	$\frac{7}{16}$	6.8	2.00	1.67	1.62	1.24	1.12
	$\frac{1}{2}$	7.7	2.25	1.87	1.81	1.37	1.25
	$\frac{1}{4}$	4.5	1.31	1.12	1.09	0.87	0.81
	$\frac{5}{16}$	5.5	1.62	1.39	1.35	1.08	1.00
	$\frac{3}{8}$	6.6	1.92	1.64	1.59	1.26	1.16
6"	$\frac{7}{16}$	7.6	2.22	1.89	1.84	1.46	1.34
	$\frac{1}{2}$	8.5	2.50	2.12	2.06	1.62	1.50
	$\frac{3}{16}$	9.5	2.78	2.36	2.29	1.80	1.66
	$\frac{1}{4}$	4.9	1.44	1.25	1.22	1.00	0.94
	$\frac{5}{16}$	6.1	1.78	1.55	1.51	1.24	1.16
$6\frac{1}{2}$ "	$\frac{3}{8}$	7.2	2.11	1.83	1.78	1.45	1.35
	$\frac{7}{16}$	8.3	2.43	2.10	2.05	1.67	1.55
	$\frac{1}{2}$	9.4	2.75	2.37	2.31	1.87	1.75
	$\frac{3}{16}$	10.4	3.06	2.64	2.57	2.08	1.94
	$\frac{1}{4}$	11.4	3.36	2.89	2.81	2.26	2.10
	$\frac{5}{16}$	12.4	3.65	3.13	3.03	2.43	2.27
	$\frac{3}{8}$	6.6	1.93	1.65	1.66	1.39	1.31
	$\frac{7}{16}$	7.8	2.30	1.97	1.97	1.64	1.54
	$\frac{1}{2}$	9.1	2.65	2.28	2.27	1.89	1.77
	$\frac{3}{16}$	10.2	3.00	2.63	2.56	2.12	2.00
	$\frac{1}{4}$	11.4	3.34	2.92	2.85	2.36	2.22
	$\frac{5}{16}$	12.5	3.67	3.20	3.12	2.57	2.41
	$\frac{3}{8}$	13.6	4.00	3.48	3.40	2.80	2.62
	$\frac{7}{16}$	14.7	4.31	3.75	3.65	2.99	2.81
	$\frac{1}{2}$	15.7	4.62	4.01	3.91	3.20	3.00

Note: The size of rivet holes is  $\frac{1}{8}$ " larger than diameter of rivet.

Contributed by Martin Joachimson

## NET AREAS OF STRUCTURAL ANGLES—II

Sum of Length of Legs	Thickness	Weight	Area	Area after Deducting for			
				One $\frac{5}{8}$ Rivet	$\frac{3}{4}$ Rivets	$\frac{7}{8}$ Rivets	
7"	$\frac{5}{16}$	7.1	2.09	1.82	1.55	1.78	1.47
	$\frac{3}{8}$	8.5	2.48	2.15	1.82	2.10	1.72
	$\frac{7}{16}$	9.8	2.87	2.49	2.11	2.43	1.99
	$\frac{1}{2}$	11.1	3.25	2.81	2.37	2.75	2.25
	$\frac{3}{16}$	12.3	3.62	3.13	2.64	3.06	2.50
$7\frac{1}{2}$ "	$\frac{5}{16}$	13.6	3.98	3.43	2.88	3.35	2.72
	$\frac{3}{8}$	14.8	4.34	3.74	3.14	3.65	2.96
	$\frac{7}{16}$	16.0	4.69	4.03	3.37	3.94	3.19
	$\frac{1}{2}$	17.1	5.03	4.32	3.61	4.22	3.41
	$\frac{3}{16}$	7.7	2.25	1.98	1.71	1.94	1.63
8"	$\frac{3}{8}$	9.1	2.67	2.34	2.01	2.29	1.91
	$\frac{7}{16}$	10.5	3.09	2.71	2.33	2.65	2.21
	$\frac{1}{2}$	11.9	3.50	3.06	2.62	3.00	2.50
	$\frac{3}{16}$	13.3	3.90	3.41	2.92	3.34	2.78
	$\frac{5}{16}$	14.6	4.30	3.75	3.20	3.67	3.04
$8\frac{1}{2}$ "	$\frac{3}{8}$	15.9	4.68	4.08	3.48	3.99	3.30
	$\frac{7}{16}$	17.2	5.06	4.40	3.74	4.31	3.56
	$\frac{1}{2}$	18.5	5.43	4.72	4.01	4.62	3.81
	$\frac{3}{16}$	8.2	2.40	2.13	1.86	2.09	1.88
	$\frac{5}{16}$	9.8	2.86	2.53	2.20	2.48	2.10
	$\frac{3}{8}$	11.3	3.31	2.93	2.55	2.87	2.43
	$\frac{7}{16}$	12.8	3.75	3.31	2.87	3.25	2.75
	$\frac{1}{2}$	14.2	4.18	3.69	3.20	3.62	3.06
	$\frac{3}{16}$	15.7	4.61	4.06	3.51	3.98	3.35
	$\frac{5}{16}$	17.1	5.03	4.43	3.83	4.34	3.65
	$\frac{3}{8}$	18.5	5.44	4.78	4.12	4.69	3.84
	$\frac{7}{16}$	19.9	5.84	5.13	4.41	5.03	4.22
	$\frac{1}{2}$	8.7	2.56	2.29	2.02	2.25	1.94
	$\frac{3}{16}$	10.4	3.05	2.72	2.39	2.67	2.29
	$\frac{5}{16}$	12.0	3.53	3.15	2.77	3.09	2.65
	$\frac{3}{8}$	13.6	4.00	3.56	3.12	3.50	3.00
	$\frac{7}{16}$	15.2	4.47	3.98	3.49	3.91	3.35
	$\frac{1}{2}$	16.8	4.92	4.37	3.82	4.29	3.66
	$\frac{3}{16}$	18.3	5.37	4.77	4.17	4.68	3.99
	$\frac{5}{16}$	19.8	5.81	5.15	4.49	5.06	4.31
	$\frac{3}{8}$	21.3	6.25	5.54	4.83	5.44	4.63
	$\frac{7}{16}$	22.7	6.67	5.90	5.14	5.79	4.91

Note: The size of rivet holes is  $\frac{1}{8}$ " larger than diameter of rivet.

Contributed by Martin Joachimson

NET AREAS OF STRUCTURAL ANGLES—I

Sum of Length of Legs	Thickness	Weight	Area	Area after Deducting for			
				One $\frac{5}{16}$ Rivet	$\frac{3}{4}$ Rivets	One	Two
4"	$\frac{3}{16}$	2.5	0.72	0.58	—	—	—
	$\frac{1}{4}$	3.2	0.94	0.75	—	—	—
	$\frac{5}{16}$	4.0	1.15	0.92	—	—	—
	$\frac{3}{8}$	4.7	1.36	1.08	—	—	—
	$\frac{7}{16}$	5.3	1.56	1.23	—	—	—
$4\frac{1}{2}$ "	$\frac{3}{16}$	2.8	0.81	0.67	0.65	—	—
	$\frac{1}{4}$	3.7	1.06	0.87	0.84	0.62	0.81
	$\frac{5}{16}$	4.5	1.31	1.08	1.04	0.77	1.00
	$\frac{3}{8}$	5.3	1.55	1.27	1.22	0.89	1.17
	$\frac{7}{16}$	6.1	1.78	1.45	1.40	1.02	1.34
5"	$\frac{1}{2}$	6.8	2.00	1.62	1.56	1.12	1.50
	$\frac{3}{16}$	3.1	0.90	0.76	0.74	—	—
	$\frac{1}{4}$	4.1	1.19	1.00	0.97	0.75	0.94
	$\frac{5}{16}$	5.0	1.47	1.24	1.20	0.93	1.16
	$\frac{3}{8}$	5.9	1.73	1.45	1.40	1.07	1.35
$5\frac{1}{2}$ "	$\frac{7}{16}$	6.8	2.00	1.67	1.62	1.24	1.56
	$\frac{1}{2}$	7.7	2.25	1.87	1.81	1.37	1.75
	$\frac{1}{4}$	4.5	1.31	1.12	1.09	0.87	1.06
	$\frac{5}{16}$	5.5	1.62	1.39	1.35	1.08	1.31
	$\frac{3}{8}$	6.6	1.92	1.64	1.59	1.26	1.54
6"	$\frac{7}{16}$	7.6	2.22	1.89	1.84	1.46	1.78
	$\frac{1}{2}$	8.5	2.50	2.12	2.06	1.62	2.00
	$\frac{3}{16}$	9.5	2.78	2.36	2.29	1.80	2.22
	$\frac{1}{4}$	4.9	1.44	1.25	1.22	1.00	1.19
	$\frac{5}{16}$	6.1	1.78	1.55	1.51	1.24	1.47
$6\frac{1}{2}$ "	$\frac{3}{8}$	7.2	2.11	1.83	1.78	1.45	1.73
	$\frac{7}{16}$	8.3	2.43	2.10	2.05	1.67	1.99
	$\frac{1}{2}$	9.4	2.75	2.37	2.31	1.87	2.25
	$\frac{3}{16}$	10.4	3.06	2.64	2.57	2.08	2.50
	$\frac{5}{8}$	11.4	3.36	2.89	2.81	2.26	2.73
	$\frac{7}{16}$	12.4	3.65	3.13	3.03	2.43	2.96
	$\frac{3}{16}$	6.6	1.93	1.65	1.66	1.39	1.62
	$\frac{3}{8}$	7.8	2.30	1.97	1.97	1.64	1.92
	$\frac{7}{16}$	9.1	2.65	2.28	2.27	1.89	2.21
	$\frac{1}{2}$	10.2	3.00	2.63	2.56	2.12	2.50
	$\frac{3}{16}$	11.4	3.34	2.92	2.85	2.36	2.78
	$\frac{5}{8}$	12.5	3.67	3.20	3.12	2.57	3.04
	$\frac{7}{16}$	13.6	4.00	3.48	3.40	2.80	3.31
	$\frac{3}{4}$	14.7	4.31	3.75	3.65	2.99	3.56
	$\frac{7}{16}$	15.7	4.62	4.01	3.91	3.20	3.81

Note: The size of rivet holes is  $\frac{1}{8}$ " larger than diameter of rivet.

Contributed by Martin Joachimson

NET AREAS OF STRUCTURAL ANGLES—II

Sum of Length of Legs	Thickness	Weight	Area	Area after Deducting for			
				One	Two	$\frac{3}{4}$ Rivets	Two
7"	$\frac{5}{16}$	7.1	2.09	1.82	1.55	1.78	1.47
	$\frac{3}{8}$	8.5	2.48	2.15	1.82	2.10	1.72
	$\frac{7}{16}$	9.8	2.87	2.49	2.11	2.43	1.99
	$\frac{1}{2}$	11.1	3.25	2.81	2.37	2.75	2.25
	$\frac{9}{16}$	12.3	3.62	3.13	2.64	3.06	2.50
$7\frac{1}{2}$ "	$\frac{5}{8}$	13.6	3.98	3.43	2.88	3.35	2.72
	$\frac{1}{2}$	14.8	4.34	3.74	3.14	3.65	2.96
	$\frac{3}{4}$	16.0	4.69	4.03	3.37	3.94	3.19
	$\frac{7}{16}$	17.1	5.03	4.32	3.61	4.22	3.41
	$\frac{5}{16}$	7.7	2.25	1.98	1.71	1.94	1.63
8"	$\frac{3}{8}$	9.1	2.67	2.34	2.01	2.29	1.91
	$\frac{7}{16}$	10.5	3.09	2.71	2.33	2.65	2.21
	$\frac{1}{2}$	11.9	3.50	3.06	2.62	3.00	2.50
	$\frac{9}{16}$	13.3	3.90	3.41	2.92	3.34	2.78
	$\frac{5}{8}$	14.6	4.30	3.75	3.20	3.67	3.04
$8\frac{1}{2}$ "	$\frac{7}{16}$	15.9	4.68	4.08	3.48	3.99	3.30
	$\frac{3}{4}$	17.2	5.06	4.40	3.74	4.31	3.56
	$\frac{5}{16}$	18.5	5.43	4.72	4.01	4.62	3.81
	$\frac{3}{8}$	8.2	2.40	2.13	1.86	2.09	1.88
	$\frac{7}{16}$	9.8	2.86	2.53	2.20	2.48	2.10
	$\frac{1}{2}$	11.3	3.31	2.93	2.55	2.87	2.43
	$\frac{3}{16}$	12.8	3.75	3.31	2.87	3.25	2.75
	$\frac{9}{16}$	14.2	4.18	3.69	3.20	3.62	3.06
	$\frac{5}{8}$	15.7	4.61	4.06	3.51	3.98	3.35
	$\frac{7}{16}$	17.1	5.03	4.43	3.83	4.34	3.65
	$\frac{3}{4}$	18.5	5.44	4.78	4.12	4.69	3.84
	$\frac{5}{16}$	19.9	5.84	5.13	4.41	5.03	4.22
	$\frac{3}{8}$	8.7	2.56	2.29	2.02	2.25	1.94
	$\frac{7}{16}$	10.4	3.05	2.72	2.39	2.67	2.29
	$\frac{1}{2}$	12.0	3.53	3.15	2.77	3.09	2.65
	$\frac{3}{16}$	13.6	4.00	3.56	3.12	3.50	3.00
	$\frac{5}{16}$	15.2	4.47	3.98	3.49	3.91	3.35
	$\frac{3}{8}$	16.8	4.92	4.37	3.82	4.29	3.66
	$\frac{7}{16}$	18.3	5.37	4.77	4.17	4.68	3.99
	$\frac{3}{4}$	19.8	5.81	5.15	4.49	5.06	4.31
	$\frac{5}{16}$	21.3	6.25	5.54	4.83	5.44	4.63
	$\frac{7}{16}$	22.7	6.67	5.90	5.14	5.79	4.91

Note: The size of rivet holes is  $\frac{1}{8}$ " larger than diameter of rivet.

Contributed by Martin Joachimson



NET AREAS OF STRUCTURAL ANGLES—III

Sum of Length of Leg	Thickness	Weight	Area	Area after Deducting for			
				3/4 Rivets		7/8 Rivets	
				One	Two	One	Two
9"	3/8	11.0	3.23	2.90	2.57	2.85	2.47
	7/16	12.8	3.75	3.35	2.99	3.31	2.87
	1/2	14.5	4.25	3.80	3.39	3.75	3.25
	9/16	16.2	4.75	4.26	3.77	4.19	3.63
	5/8	17.8	5.23	4.68	4.14	4.60	3.97
	11/16	19.5	5.72	5.12	4.52	5.03	4.34
	3/4	21.1	6.19	5.53	4.88	5.44	4.69
	13/16	22.7	6.65	5.94	5.23	5.84	5.09
	7/8	24.2	7.11	6.34	5.58	6.23	5.35
	15/16	25.7	7.55	6.73	5.94	6.66	5.71
9 1/2"	3/8	13.6	3.97	3.59	3.21	3.53	3.09
	7/16	15.3	4.50	4.06	3.62	4.00	3.50
	1/2	17.1	5.03	4.54	4.05	4.47	3.91
	9/16	18.9	5.55	5.00	4.45	4.92	4.29
	5/8	20.6	6.06	5.46	4.86	5.37	4.68
	11/16	22.3	6.56	5.90	5.24	5.81	5.06
	3/4	24.0	7.06	6.35	5.64	6.25	5.44
	13/16	25.7	7.55	6.78	6.02	6.67	5.79
	7/8	27.3	8.03	7.21	6.39	7.09	6.15
	15/16	28.9	8.50	7.63	6.75	7.50	6.50
10"	3/8	12.3	3.61	3.28	2.95	3.23	2.85
	7/16	14.3	4.18	3.80	3.42	3.74	3.30
	1/2	16.2	4.75	4.31	3.87	4.25	3.75
	9/16	18.1	5.31	4.82	4.33	4.75	4.19
	5/8	20.0	5.86	5.31	4.76	5.23	4.60
	11/16	21.8	6.41	5.81	5.21	5.72	5.03
	3/4	23.6	6.94	6.28	5.63	6.19	5.44
	13/16	25.4	7.47	6.76	6.05	6.66	5.85
	7/8	27.2	7.99	7.22	6.46	7.11	6.23
	15/16	28.9	8.50	7.68	6.86	7.56	6.62
10 1/2"	3/8	15.0	4.40	4.00	3.64	3.96	3.53
	7/16	17.0	5.00	4.55	4.13	4.50	4.00
	1/2	19.1	5.59	5.10	4.61	5.03	4.47
	9/16	21.0	6.17	5.62	5.08	5.54	4.92
	5/8	23.0	6.75	6.15	5.55	6.06	5.37
	11/16	24.9	7.31	6.65	6.00	6.56	5.81
	3/4	26.8	7.87	7.16	6.45	7.06	6.25
	13/16	28.7	8.42	7.65	6.89	7.54	6.67
	7/8	30.5	8.97	8.15	7.33	8.03	7.10
	15/16	32.3	9.50	8.63	7.75	8.50	7.50

Note: The size of rivet holes is 1/8" larger than diameter of rivet.

Contributed by Martin Joachimson

NET AREAS OF STRUCTURAL ANGLES—IV

Sum of Length of Legs	Thickness	Weight	Area	Area after Deducting for			
				3/4 Rivets		7/8 Rivets	
				One	Two	One	Two
12"	3/8	14.9	4.36	4.03	3.70	3.98	3.60
	7/16	17.2	5.06	4.68	4.30	4.62	4.18
	1/2	19.6	5.75	5.31	4.87	5.25	4.75
	9/16	21.9	6.43	5.94	5.45	5.87	5.31
	5/8	24.2	7.11	6.56	6.01	6.48	5.85
	11/16	26.5	7.78	7.18	6.58	7.09	6.40
	3/4	28.7	8.44	7.78	7.12	7.69	6.94
	13/16	31.0	9.09	8.38	7.67	8.28	7.47
	7/8	33.1	9.74	8.97	8.21	8.86	7.98
	15/16	35.3	10.37	9.55	8.73	9.43	8.49
14"	3/8	23.0	6.76	6.31	5.89	6.26	5.76
	7/16	26.0	7.65	7.16	6.67	7.09	6.53
	1/2	28.7	8.44	7.89	7.35	7.82	7.19
	9/16	31.7	9.32	8.72	8.12	8.63	7.94
	5/8	33.8	9.94	9.28	8.63	9.19	8.44
	11/16	36.6	10.76	10.05	9.34	9.95	9.14
	3/4	39.5	11.62	10.85	10.09	10.74	9.87
	13/16	42.0	12.35	11.53	10.71	11.41	10.48
	7/8	44.4	13.06	12.19	11.31	12.06	11.06
	15/16	46.4	13.75	12.80	11.90	12.65	11.65
16"	3/8	29.6	8.69	8.20	7.71	8.13	7.57
	7/16	32.7	9.61	9.06	8.52	8.99	8.36
	1/2	35.8	10.53	9.93	9.33	9.84	9.15
	9/16	38.9	11.44	10.78	10.13	10.69	9.94
	5/8	42.0	12.34	11.63	10.93	11.52	10.72
	11/16	45.0	13.23	12.47	11.71	12.35	11.48
	3/4	48.1	14.12	13.31	12.49	13.18	12.24
	13/16	51.0	15.00	14.13	13.25	14.00	13.00
	7/8	54.0	15.87	14.95	14.01	14.81	13.75
	15/16	56.9	16.74	15.76	14.77	15.62	14.49

Area Deducted for Various Sizes of Rivets and Thickness of Angles.

No. of Size of Rivets	Thickness									
	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
1	0.09	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38
2	0.12	0.16	0.20	0.23	0.27	0.31	0.35	0.39	0.43	0.47
3	0.14	0.19	0.23	0.28	0.33	0.38	0.42	0.47	0.52	0.56
4	0.16	0.22	0.27	0.33	0.38	0.44	0.49	0.55	0.60	0.66
5	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72
6	0.19	0.25	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75
7	0.20	0.26	0.32	0.39	0.46	0.52	0.58	0.65	0.72	0.78
8	0.21	0.27	0.33	0.40	0.47	0.54	0.61	0.68	0.75	0.82
9	0.22	0.28	0.34	0.41	0.48	0.55	0.62	0.70	0.77	0.84

Note: The size of rivet holes is 1/8" larger than diameter of rivet.

Contributed by Martin Joachimson